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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/598,517	09/01/2006	Paul R. Kruesi	1001-6-PUS	6754
23442	7590	06/10/2010	EXAMINER	
SHERIDAN ROSS PC 1560 BROADWAY SUITE 1200 DENVER, CO 80202			BUCHANAN, JACOB	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/598,517

Applicant(s)

KRUESI, PAUL R.

Examiner

Jacob Buchanan

Art Unit

1795

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 March 2010.
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 and 18-25 is/are pending in the application.
4a) Of the above claim(s) 18-25 is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-6 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SI/22)
4) ☐ Interview Summary (PTO-413)
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____
Paper No(s)/Mail Date _____

DETAILED ACTION

Response to Amendment

1. This Office action addresses pending claims 1-6 and 18-25. Claims 7-17 and 26-28 were cancelled and claim 1 was amended in the amendment mailed March 2, 2010. Further, it is noted that while this amendment has been entered, it does not comply with MPEP 714 or 37 CFR 1.121(c)(2) because the added subject matter was not shown by underlining the added text.

Claim Rejections - 35 USC § 102

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
3. Claims 1 and 6 are rejected under 35 U.S.C. 102(b) as being anticipated by Ishida et al. (US 4,711,828).

Regarding **claim 1**, Ishida discloses a fuel cell **(1) (abstract, Figure 1)** comprising:

- An anode **(5)**
- A cathode **(6)**
- A membrane **(14)** that separates the anode and the cathode
- An electrolyte comprising a hydrated alkaline earth chloride selected from the group consisting of hydrated **magnesium chloride (C3/L20)**, hydrated calcium chloride, hydrated strontium chloride, and mixtures thereof.

Further, Ishida teaches a carbon fuel **(see “carbon dioxide”, C1/L62-68)**.

Regarding **claim 6**, Ishida discloses all of the claim limitations as set forth above. Ishida additionally discloses the fuel cell wherein the membrane **(14)** comprises at least one **proton permeable membrane (C5/L14-16)** and a ceramic cloth.

4. Claims 1 and 6 are rejected under 35 U.S.C. 102(b) as being anticipated by Berger et al. (US 3,497,389).

Regarding **claim 1**, Berger discloses a fuel cell **(10) (C1/L30-39, Figure 1)** comprising:

- An anode **(14)**
- A cathode **(16)**
- A membrane **(12)** that separates the anode and the cathode
- An electrolyte comprising a hydrated alkaline earth chloride selected from the group consisting of hydrated magnesium chloride, hydrated **calcium chloride (C2/L57-62)**, hydrated strontium chloride, and mixtures thereof.

Regarding limitations recited in claim 1, which are directed to a manner of operating disclosed fuel cell, it is noted that neither the manner of operating a disclosed device nor material or article worked (i.e. "a carbon fuel") upon further limit an apparatus claim. Said limitations do not differentiate apparatus claims from prior art. See MPEP § 2114 and 2115. Further, it has been held that process limitations do not have patentable weight in an apparatus claim. See Ex parte Thibault, 164 USPQ 666, 667 (Bd. App. 1969) that states "Expressions relating the apparatus to contents thereof and to an intended operation are of no significance in determining patentability of the

apparatus claim.” For the purpose of this Office action, these limitations, including claims 2 and 3, have not been treated on the merits.

Regarding **claim 6**, Berger discloses all of the claim limitations as set forth above. Ishida additionally discloses the fuel cell wherein the membrane (**14**) comprises at least one **proton permeable membrane (see “ion conducting membrane”, C3/L64)** and a ceramic cloth.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. Claims 1-3 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over by Pesavento (US 6,200,697) in view of Ishida et al. (US 4,711,828) or Berger et al. (US 3,497,389).

Regarding **claim 1**, Pesavento discloses a fuel cell **(1)** (**abstract, Figure 1**) comprising:

- An anode **(19)**
- A cathode **(15)**
- A membrane that separates the anode **(19)** and the cathode **(15)** **(C5/L16-25)**
- An electrolyte **(27)**
- A carbon fuel **(21, 33)**

The reference does not explicitly disclose said electrolyte comprising a hydrated alkaline earth chloride selected from the group consisting of hydrated magnesium chloride, hydrated calcium chloride, hydrated strontium chloride, and mixtures thereof.

Ishida teaches a carbon monoxide-oxygen fuel cell (**abstract, Figure 1**) wherein a carbon fuel (*carbon dioxide*) is reacted. A complexing agent, including magnesium chloride **(C3/L20)** is used in the electrolyte **(C3/L8-21)** for combining with and improving the effectiveness of the catalyst **(C3/L7-25, C3/L51-66)**.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the magnesium chloride of Ishida with the fuel cell electrolyte of Pesavento for the purpose of improving the effectiveness of the catalyst.

Or, Berger teaches a fuel cell **(10)** comprising an ion exchange membrane and a water balancing agent, including calcium chloride **(C2/L62-63)**, which function to retain water and provide suitable and substantial water vapor pressures above 100°C **(C2/L23-35)**.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine calcium chloride water balancing agent of Berger with the fuel cell electrolyte of Pesavento for the purpose of maintaining hydration of the separator at high temperatures.

Regarding **claim 2**, modified Pesavento discloses all of the claim limitations as set forth above. Pesavento additionally discloses the fuel cell wherein the carbon comprises an activated carbon (**C5/L62-67**).

Regarding **claim 3**, modified Pesavento discloses all of the claim limitations as set forth above. Pesavento additionally discloses the fuel cell wherein the carbon comprises carbon recovered from organic waste (**C4/L21-28, C5/L62-67**).

Regarding **claim 5**, modified Pesavento discloses all of the claim limitations as set forth above. Pesavento additionally discloses the fuel cell wherein the cathode is selected from the group consisting of stainless steel, catalytic carbon, porous nickel, oxygen-reacting cathodes, and graphite (**C3/L23-28**).

Regarding limitations recited in claims 1-3, which are directed to a manner of operating disclosed fuel cell, it is noted that neither the manner of operating a disclosed device nor material or article worked (i.e. "a carbon fuel", "wherein the carbon comprises an activated carbon", "wherein the carbon comprises carbon recovered from organic waste") upon further limit an apparatus claim. Said limitations do not differentiate apparatus claims from prior art. See MPEP § 2114 and 2115. Further, it has been held that process limitations do not have patentable weight in an apparatus claim. See *Ex parte Thibault*, 164 USPQ 666, 667 (Bd. App. 1969) that states "Expressions relating

the apparatus to contents thereof and to an intended operation are of no significance in determining patentability of the apparatus claim.” For the purpose of this Office action, these limitations, including claims 2 and 3, have not been treated on the merits.

8. Claims 1-2 and 4-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over by Tao (US 2002/0015877) in view of Ishida et al. (US 4,711,828) or Berger et al. (US 3,497,389).

Regarding claim 1, Tao discloses a fuel cell **(10)** ([0020], **Figure 1**) comprising:

- An anode **(16)**
- A cathode **(20)**
- A membrane that separates the anode **(16)** and the cathode **(20)** ([0007], [0020], see “electrolyte contacts both the anodic section and the cathodic section”, **Figures 1-2**)
- An electrolyte **(18)**
- A carbon fuel ([0006])

The reference does not explicitly disclose said electrolyte comprising a hydrated alkaline earth chloride selected from the group consisting of hydrated magnesium chloride, hydrated calcium chloride, hydrated strontium chloride, and mixtures thereof.

Ishida teaches a carbon monoxide-oxygen fuel cell (**abstract, Figure 1**) wherein a carbon fuel (*carbon dioxide*) is reacted. A complexing agent, including magnesium chloride (**C3/L20**) is used in the electrolyte (**C3/L8-21**) for combining with and improving the effectiveness of the catalyst (**C3/L7-25, C3/L51-66**).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the magnesium chloride of Ishida with the fuel cell electrolyte of Tao for the purpose of improving the effectiveness of the catalyst.

Or, Berger teaches a fuel cell **(10)** comprising an ion exchange membrane and a water balancing agent, including calcium chloride **(C2/L62-63)**, which function to retain water and provide suitable and substantial water vapor pressures above 100°C **(C2/L23-35)**.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine calcium chloride water balancing agent of Berger with the fuel cell electrolyte of Tao for the purpose of maintaining hydration of the separator at high temperatures.

Regarding **claim 2**, modified Tao discloses all of the claim limitations as set forth above. Tao additionally discloses the fuel cell wherein the carbon comprises an activated carbon **([0023], see “anode selected from... activated carbon”, [0005], [0040], see “employs a carbon anode as a fuel source”)**.

Regarding limitations recited in claims 1-2, which are directed to a manner of operating disclosed fuel cell, it is noted that neither the manner of operating a disclosed device nor material or article worked (i.e. “a carbon fuel”, “wherein the carbon comprises an activated carbon”, “wherein the carbon comprises carbon recovered from organic waste”) upon further limit an apparatus claim. Said limitations do not differentiate apparatus claims from prior art. See MPEP § 2114 and 2115. Further, it has been held that process limitations do not have patentable weight in an apparatus claim. See Ex

parte Thibault, 164 USPQ 666, 667 (Bd. App. 1969) that states "Expressions relating the apparatus to contents thereof and to an intended operation are of no significance in determining patentability of the apparatus claim." For the purpose of this Office action, these limitations, including claims 2 and 3, have not been treated on the merits.

Regarding **claim 4**, modified Tao discloses all of the claim limitations as set forth above. Tao additionally discloses the fuel cell wherein the anode **(16)** is selected from the group consisting of catalytically-enhance carbon, nickel metals and graphite **([0023])**.

Regarding **claim 5**, modified Tao discloses all of the claim limitations as set forth above. Tao additionally discloses the fuel cell wherein the cathode is selected from the group consisting of stainless steel, catalytic carbon, porous nickel, oxygen-reacting cathodes, and graphite **([0028])**.

9. Claims 1, 3, and 5-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over by Cooper et al. (US 2002/0106549) in view of Ishida et al. (US 4,711,828) or Berger et al. (US 3,497,389).

Regarding **claim 1**, Cooper discloses a fuel cell **(10)** **([0021], Figure 1)** comprising:

- An anode **(14)**
- A cathode **(16)**
- A membrane **(18)** that separates the anode **(14)** and the cathode **(16)**
- An electrolyte **(24)**

- A carbon fuel **(22)**

The reference does not explicitly disclose said electrolyte comprising a hydrated alkaline earth chloride selected from the group consisting of hydrated magnesium chloride, hydrated calcium chloride, hydrated strontium chloride, and mixtures thereof.

Ishida teaches a carbon monoxide-oxygen fuel cell (**abstract, Figure 1**) wherein a carbon fuel (*carbon dioxide*) is reacted. A complexing agent, including magnesium chloride (**C3/L20**) is used in the electrolyte (**C3/L8-21**) for combining with and improving the effectiveness of the catalyst (**C3/L7-25, C3/L51-66**).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the magnesium chloride of Ishida with the fuel cell electrolyte of Cooper for the purpose of improving the effectiveness of the catalyst.

Or, Berger teaches a fuel cell **(10)** comprising an ion exchange membrane and a water balancing agent, including calcium chloride (**C2/L62-63**), which function to retain water and provide suitable and substantial water vapor pressures above 100°C (**C2/L23-35**).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine calcium chloride water balancing agent of Berger with the fuel cell electrolyte of Cooper for the purpose of maintaining hydration of the separator at high temperatures.

Regarding **claim 3**, modified Cooper discloses all of the claim limitations as set forth above. Cooper additionally discloses the fuel cell wherein the carbon comprises carbon recovered from organic waste (**[0032]**).

Regarding limitations recited in claims 1 and 3, which are directed to a manner of operating disclosed fuel cell, it is noted that neither the manner of operating a disclosed device nor material or article worked (i.e. "a carbon fuel", "wherein the carbon comprises an activated carbon", "wherein the carbon comprises carbon recovered from organic waste") upon further limit an apparatus claim. Said limitations do not differentiate apparatus claims from prior art. See MPEP § 2114 and 2115. Further, it has been held that process limitations do not have patentable weight in an apparatus claim. See *Ex parte Thibault*, 164 USPQ 666, 667 (Bd. App. 1969) that states "Expressions relating the apparatus to contents thereof and to an intended operation are of no significance in determining patentability of the apparatus claim." For the purpose of this Office action, these limitations, including claims 2 and 3, have not been treated on the merits.

Regarding **claim 5**, modified Cooper discloses all of the claim limitations as set forth above. Cooper additionally discloses the fuel cell wherein the cathode is selected from the group consisting of stainless steel, catalytic carbon, porous nickel, oxygen-reacting cathodes, and graphite (**claims 25 and 28**).

Regarding **claim 6**, modified Cooper discloses all of the claim limitations as set forth above. Cooper additionally discloses the fuel cell wherein the membrane (**18**) comprises at least one proton permeable membrane and a ceramic cloth (**[0026]**).

Response to Arguments

10. Applicant's arguments with respect to claim 1 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jacob Buchanan whose telephone number is (571)270-1186. The examiner can normally be reached on Monday - Friday 7:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Basia Ridley can be reached on (571)272-1453. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/J. B./
Examiner, Art Unit 1795

/Basia Ridley/
Supervisory Patent Examiner, Art Unit 1795